positioning at least one of said first and second fulcrum points to allow flexing of at least one of said first and second arms about at least one of said fulcrum points to provide a desired temperature-dependant axial stress on said Bragg grating to substantially compensate for temperature-dependant variations of a Bragg wavelength of said Bragg grating.

A2 cont.

REMARKS

Claims 1-22 are pending in this application. Claim 23 has been canceled.

Drawing Objection

The drawings have been objected to as including certain informalities. Applicants are in the process of preparing formal drawings which correct these informalities and will file such formal drawings as soon as possible and not later than October 20, 2001 (the extended period of response to the last Office Action).

Examiner Interview

Applicants appreciate the courtesies extended to their representative, Michael Cammarata, during the personal interview conducted on September 21, 2001.

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During this interview, the Lemaire references were discussed at length in relation to the pending claims. The arguments presented during the interview are largely repeated below. After some consideration it was agreed that amendments to the claims (specified below) would overcome all of the applied art of record. This Reply formalizes the agreements reached during the interview.

Art Rejections

Claims 1-3, 5-8, 10-12, 14, 15, 22, and 23 are rejected under 35 U.S.C. § 102(e) as being anticipated by Lemaire '341 (USP 6,147,341, hereinafter "Lemaire '341"). Claims 4,9,13,16-19, and 21 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Lemaire '341. Claim 20 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Lemaire '920 (USP 5,841,920, hereinafter "Lemaire '920"). These rejections, insofar as they pertain to the presently pending claims, are respectfully traversed.

Lemaire '341 discloses a temperature compensating package for fiber gratings that essentially consists of two concentric tubes (outer and inner expansion members 14,16) having different thermal expansion coefficients. A pivoting lever 18 provides a mechanical advantage to the differently expanding tubes so as to

impart an axial strain the counteracts period changes in the Bragg grating as the device is heated and cooled.

Lemaire '920 discloses a fiber grating package 5 which includes a tension adjustment member 70 into which the compensating member 60 is placed. The fiber is affixed to the top surface of member 60. Due to the differing thermal expansion coefficients for members 60 and 70, a change in ambient temperature (e.g. lowering) will cause the tension adjusting member to squeeze the legs 63 of the member 60 thereby cause member 60 to curvedly elongate. In this way, temperature changes lead to amplified strain changes in the fiber glued to the top surface of member 60.

None of the applied art, taken alone or in combination, discloses or suggests the invention particularly as recited in amended independent claims 1, 19, 20, 21, or 22.

More particularly, all of the pending claims recite a base having first and second spaced arms extending from the base and a strut disposed between and substantially perpendicular to the arms. In contrast, the Lemaire '341 concentric tube arrangement is quite distinct from these features.

The Office Action alleges that Lemaire 314's disc 13, skirt 24, and levers 18 teach the claimed first and arms and that the outer expansion member 16 teaches the claimed base. These

elements, however, are not arranged as recited in the claims and do not function in the same manner to provide a temperature-compensated fiber grating package. The alleged arms (levers 18, skirt 24 and disc 13) do not extend from the alleged base (outer expansion member 16). Furthermore, the alleged strut (inner expansion member 14) is parallel, not substantially perpendicular to the alleged base (outer expansion member 16).

In addition and with respect to independent claims 1, 19, and 22 none of the applied art discloses or suggests the strut forming first and second fulcrums between the strut and the first and second arms, respectively. Although Lemaire '341 includes levers 18 at one end of the device, such levers 18 are quite distinct both structurally and functionally from the claimed fulcrums.

Moreover, additional features of the claims not mentioned specifically above further distinguish the invention from the applied art of record. For all of these reasons, taken alone or in combination, applicants respectfully request reconsideration and withdrawal of the outstanding art rejections.

Conclusion

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully

requested to contact Michael R. Cammarata (Reg. No. 39,491) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

Applicants hereby petition for a one (1) month extension of time for filing this Reply. Please charge a large entity one (1) month extension fee of $ 110.00 pursuant to 37 C.F.R. § 1.17(a)(2) to our Deposit Account No. 50-0308.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 50-0308 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

By _____

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Claim 23 has have been canceled.

The claims of the invention has been amended as follows:

1. (Amended) A temperature-compensated fiber grating package comprising:

a base having first and second spaced arms extending from said base and including a first material having a first coefficient of thermal expansion;

a strut disposed between and substantially perpendicular to said first and second arms,

said strut including a second material having a second coefficient of thermal expansion less than said first coefficient of thermal expansion and having a first end in contact with an interior surface of said first arm to define a first fulcrum point, and a second end in contact with an interior surface of said second arm to define a second fulcrum point; and

an optical fiber having a Bragg grating formed therein, said optical fiber having a first portion adjacent a first end of said Bragg grating being affixed to said first arm and a second portion adjacent a second end of said Bragg grating being affixed to said second arm, said Bragg grating thereby being disposed between said first and second arms, at least one of said first and second arms thereby flexing about at least one of said fulcrum points to provide a temperature-dependent axial stress on said Bragg grating to substantially compensate for temperature-dependant variations of a Bragg wavelength of said Bragg grating.

19. (Amended) A method of making a temperature-compensated grating package comprising [the steps of]:

providing a base including first and second spaced arms extending from the base and having a first material having a first coefficient of thermal expansion;

providing a strut substantially perpendicular to and between said first and second arms, said strut having a first end in contact with an interior surface of said first arm to define a first fulcrum point, and a second end in contact with an interior surface of said second arm to define a second fulcrum point, said strut including a second material having a

second coefficient of thermal expansion less than said first coefficient of thermal expansion;

affixing a first portion of an optical fiber to said first arm and a second portion of said optical fiber to said second arm; and

forming a Bragg grating in said optical fiber between said first and second arms.

20. (Amended) A method of making a temperature-compensated grating package comprising:

providing a base including first and second spaced arms extending from the base and having a first material having a first coefficient of thermal expansion;

providing a strut substantially perpendicular to and between said first and second arms, said strut having a first end in contact with an interior surface of said first arm, and a second end in contact with an interior surface of said second arm, said strut including a second material having a second coefficient of thermal expansion less than said first coefficient of thermal expansion;

providing an optical fiber with a Bragg grating formed therein;

heating said base, said strut, and said Bragg grating to a temperature which provides a Bragg wavelength of said Bragg grating which is at least substantially equivalent to a desired Bragg wavelength, said temperature being above an intended use temperature of said package;

affixing said optical fiber to said base with said Bragg grating disposed between said first and second arms while maintaining said base, said strut, and said Bragg grating at said temperature; and

cooling said base, said strut and said Bragg grating.

21. (Amended) A method of making a temperature-compensated grating package comprising [the steps of]:

providing a base including first and second spaced arms extending from the base and having a first material having a first coefficient of thermal expansion;

providing a strut substantially perpendicular to and between said first and second arms, said strut having a first end in contact with an interior surface of said first arm, and a second end in contact with an interior surface of said second arm, said strut including a second material having a second coefficient of thermal expansion less than said first coefficient of thermal expansion;

providing an optical fiber with a Bragg grating formed therein, said Bragg grating having an initial Bragg wavelength which is longer than a desired Bragg wavelength;

affixing said optical fiber to said first and second arms using a bonding material, said Bragg grating being disposed between said first and second arms;

heating at least one of said base, said bonding material, said strut, and said fiber to achieve stress relaxation in said Bragg grating;

allowing said at least one of said base, said bonding material, said strut and said fiber to cool; and

repeating said heating and cooling steps until said desired Bragg wavelength of said Bragg grating is observed.

22. (Amended) A method of making a temperature-compensated grating package comprising [the steps of]:

providing a base including first and second spaced arms extending from the base and having a first material having a first coefficient of thermal expansion;

providing a strut substantially perpendicular to and between said first and second arms, said strut having a first end in contact with an interior surface of said first arm to define a first fulcrum point, and a second end in contact with

an interior surface of said second arm to define a second fulcrum point, said strut including a second material having a second coefficient of thermal expansion less than said first coefficient of thermal expansion;

providing an optical fiber with a Bragg grating formed therein;

affixing said optical fiber to said base with said Bragg grating disposed between said first and second arms; and

positioning at least one of said first and second fulcrum points to allow flexing of at least one of said first and second arms about at least one of said fulcrum points to provide a desired temperature-dependant axial stress on said Bragg grating to substantially compensate for temperature-dependant variations of a Bragg wavelength of said Bragg grating.